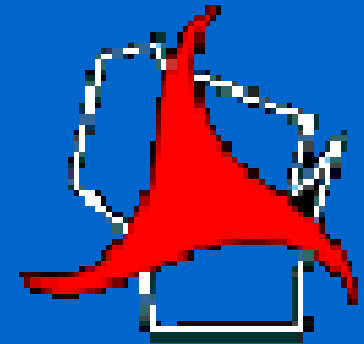


THE WISDOT EXPERIENCE



Establishing a Traffic Monitoring System Based on the TRADAS[©] Software System

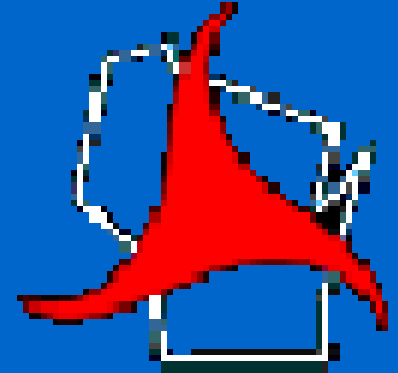
TRADAS[©] is copyrighted software created by Chaparral
Systems
Corporation, Santa Fe, NM

Background



- March - May 1991 Concentrated Analysis Group
 - Broad group of traffic data users and producers
 - Created a data model
 - Created a process model
 - Identified system output requirements
 - Examined current available technologies
 - Provided guidance for technical and strategic planning

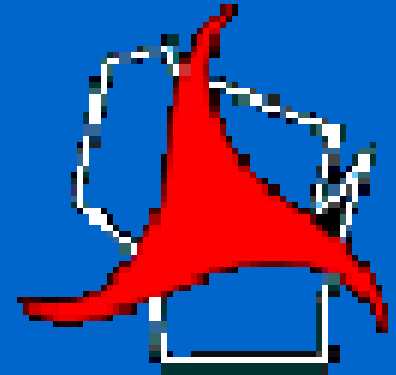
Background



- May - September 1991 Technical Team
 - Developed system specifications
 - Evaluated technologies
 - Developed alternatives and recommendations
 - Build system in house
 - Contract system creation
 - Purchase existing system with WISDOT specific modifications

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In House Development Option



Four Phase Design

Phase 1 - Process field data to main frame data base

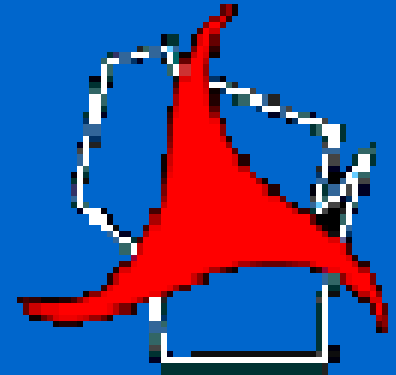
Phase 2 - Develop factoring and summarization programs

Phase 3 - Develop GIS based reporting system

Phase 4 - Develop non-spatial reporting systems

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In House Development Option



Estimated Timeline To Develop

Phase 1 - 10 months

2 programmers & 1 user

Phase 2 - 8 months

2 programmers & 2 user

Phase 3 - 6 months

2 programmers & 1 user

Phase 4 - 6 months

1 programmers & 2 user

Estimated time to implementation

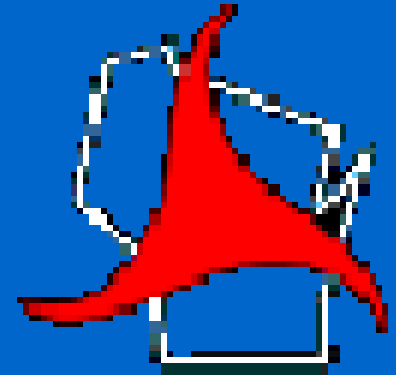
2.5 to 4 calendar year

6.8 person years

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Contract Development Option



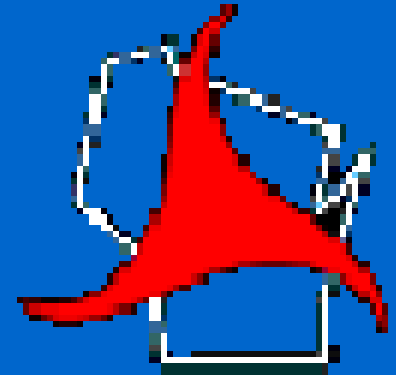
This option would parallel the In House Option
Could be done faster based on resource availability

Purchase Existing System



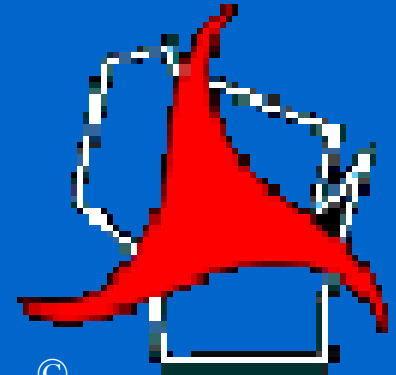
- Acquire Traffic Monitoring System
 - Public domain software created for New Mexico
 - Estimate 7 months from contracting to have system modified to the WISDOT mainframe environment
 - Would parallel Phases 1, 2 and 4 of the in house build option

Estimated Costs



- In House Option
 - \$400,000 - \$450,000 plus computer charges
- Contract Build Option
 - Not determined but estimated to be higher than above
- Purchase and Modify
 - \$100,000 - \$150,000 plus computer charges for testing and evaluation

Modifications in the Plan



- Chaparral proposes the development of Tradas[©]
 - TMS upgrade services will not be offered
- WISDOT to lose Mainframe
 - Move implementation to HP-UX Platform
 - Requires new workstation and mass storage
- Pros
 - Software will have a standard base across states
 - Platform will be under program area control
 - Mainframe related costs eliminated

Implementation



- 7/92 Contract to purchase is signed
- 9/92 Workstation arrives
- 10/92 Daily Processing Continuous Volume
 - Processed ATR data
 - Performed File Validity Checks
 - Performed “Standards” Conformity Checks
 - Provided Pass, Fail, and Operator Decision Options
 - Daily Operator and Data Reports
- 10/92 DCMS automated polling module
 - Provided a remote control of vendor ATR polling
 - Based on Win 3.2 Software
 - Discontinued use when Dept. changed to OS/2

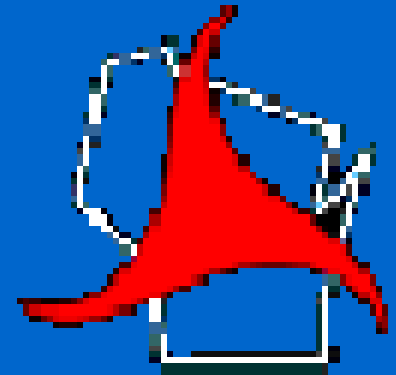
Implementation



- 3/93 WIM Daily processing
- 3/93 Short term Volume
 - Same as ATR plus AADT Estimate
- 3/93 Chaparral started redesign of basic data structures
 - Basic Data design was bloated
 - System was sluggish
- 11/93 User Interface (UI)
 - New Data design was implemented with GUI
 - Marked improvement in performance
- 11/93 Monthly Processing
 - Monthly Data Summary Files for ATR Data
 - Monthly Summary reports

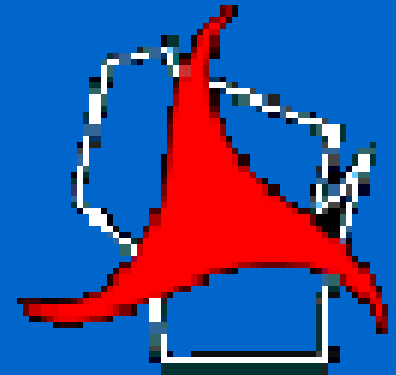
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Implementation



- 1/94 Annual Processing
 - Phase 1
 - Annual Factor Development
 - Annual Summary Files and Reports
 - Phase 2
 - Computation of Short Term Count AADT
 - Historical AADT verification checks
 - Multiple Count AADT checks
 - Phase 3
 - Annual System Estimates
 - Highway Segment statistics
 - VMT estimates

Implementation



- 4/94 Data Archive
 - Monthly Archive of ATR data
 - Annual Archive of Short Count Data
- 11/94 Chaparral and Users Plan for a Version 2
 - Version 1 based on SAS
 - Not a system programming language
 - Minimal data set security
 - Lack of speed
 - Version 2 Goals
 - C++ Programming language
 - Oracle Data Base Engine
 - Greater Speed and Security

Software Costs to Date



Tradas©	\$205,000
Consulting and Travel	52,700
7/94-6/95 Maintenance	32,800
7/95-6/96 Maintenance	32,800
7/96-6/97 Maintenance	32,800
7/97-6/98 Maintenance	36,000
7/98-6/99 Maintenance	37,800
7/99-6/00 Maintenance	39,700
7/00-6/01 Maintenance	41,685
Total	\$512,285

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Current Status



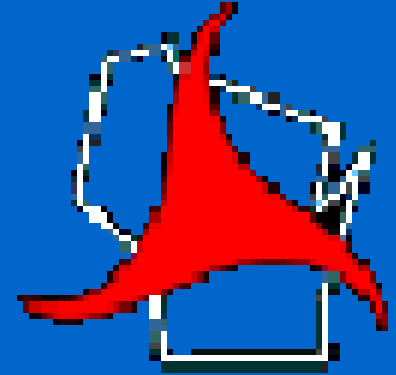
- Concurrently processing in both Version 1 and 2
 - Version 1
 - Fully Functional
 - Batch process all files daily
 - 2 - 4 Hours Processing time
 - 1 - 2 Hours Operator Interaction time
 - Monthly Processing
 - Done overnight
 - TWS and SHRP submittals done separately - 1 hour and data is ready to ship

Current Status



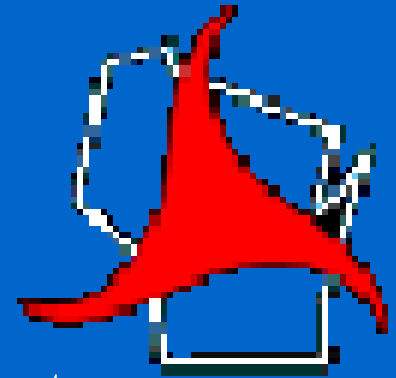
- Annual Processing Phase 1
 - 3 Hour Processing Time
 - 1 - 2 Weeks of Operator Analysis
 - Usually 2 - 3 iterations of this step
 - Normally Completed by Mid January
- Phase 2
 - 2 Hour Processing Time
 - Allow 1 Week for analysis
 - Completed by end of January
- Phase 3
 - 3 Hour Processing Time
 - Completion dependent on other systems

Current Status



- Version 2
 - Daily and Monthly systems tested
 - All 1999 WIM data processed through system in under two weeks
 - Cannot test Annual until full year of data from ATR's available
 - At present cannot keep up with daily data load
 - This problem solved or work around promised in time to process all 2000 data through system by 11/30/00

Lessons Learned



- Design and Implementation of a system of this magnitude is neither easy or painless.
- Technology is moving forward in hardware and software faster than a system can be designed and implemented.
- Carefully evaluate where you are and what you have before altering your plan.
- Don't promise deliverables to your customers before you have product in hand.

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Lessons Learned

- Accept that Change is unavoidable.
- Be optimistic



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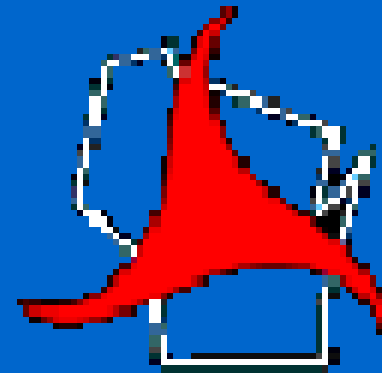
Recommendations



- Do a full system needs analysis
- Evaluate your options/needs for building
 - Your unique system
 - Meeting your needs with a standard system
- Expect major delays.
- Budget up front for annual maintenance
- Realize that there is no such thing as a “Turn Key” system!

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Decisions



- Did we make the right decision?

- For WISDOT and the time - Yes!

It has met our need for timely processing, validation, and publication of traffic data.

- It has had a positive budgetary impact in reducing costs to process data and staff to administer the program.

Decisions



- Is it the right one for you?

Don't look here for the answer -
you have to make that call yourself.